

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	566	717/120.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/06/11 08:03
L2	91941	(merg\$3 or consolidat\$3 or unify or unification or combin\$5 ) same (business or enterprise or commerce or work or corporation or company or companies)	USPAT	OR	OFF	2007/06/11 08:03
L3	34	I1 and I2	USPAT	OR	OFF	2007/06/11 08:03
S1	211	717/120.ccls.	USPAT	OR	OFF	2007/06/11 08:03
S2	91535	(merg\$3 or consolidat\$3 or unify or unification or combin\$5 ) same (business or enterprise or commerce or work or corporation or company or companies)	USPAT	OR	OFF	2007/06/11 08:03
S3	2888	(merg\$3 or consolidat\$3 or unify or unification or combin\$5 or integrat\$3 ) same (business or enterprise or commerce or work or corporation or company or companies) and (business near3 (process or rules or functions or scope) )	USPAT	OR	ON	2007/05/17 16:54
S4	23	business near5 merg\$3 and workflow	USPAT	OR	ON	2007/05/17 17:19
S5	745	(merg\$3 or consolidat\$3 or unify or unification or combin\$5 or integrat\$3 ) same (business or enterprise or commerce or work or corporation or company or companies) and (business near3 (process or rules or functions or scope) ) and workflow	USPAT	OR	ON	2007/05/17 16:54
S6	765	(merg\$3 or consolidat\$3 or unify or unification or combin\$5 or integrat\$3 ) same (business or enterprise or commerce or work or corporation or company or companies) and (business near3 (process or rules or functions or scope) ) and (workflow or gantt or pert)	USPAT	OR	ON	2007/05/17 16:54

## EAST Search History

S7	143	(business or enterprise or commerce) and rules near5 (fault or error or inconsistenc\$3 or contradict\$3 or loop\$3 or redundan\$4 or incomplete\$4 ) and (business or enterprise or commerce) near5 process and (graph\$3 or"top down" or "depth first" or transition\$3 or tree ) and (communication or IO or "I/O" or protocol ) and (database or "data base" or query or queries or r dbs )	USPAT	OR	ON	2007/05/17 17:23
S8	25	(business or enterprise or commerce) same rules near5 (fault or error or inconsistenc\$3 or contradict\$3 or loop\$3 or redundan\$4 or incomplete\$4 ) and (business or enterprise or commerce) near5 process and (graph\$3 or"top down" or "depth first" or transition\$3 or tree ) and (communication or IO or "I/O" or protocol ) and (database or "data base" or query or queries or r dbs )	USPAT	OR	ON	2007/05/17 17:40
S9	25	(business or enterprise or commerce) near5 (merg\$3 or acquisition) same (business or enterprise or commerce) near5 process	USPAT	OR	ON	2007/05/17 17:41
S10	390	(business or enterprise or commerce) near5 (merg\$3 or acquisition or integrat\$3 ) same (business or enterprise or commerce) near5 process	USPAT	OR	ON	2007/05/17 17:41
S11	269	(business or enterprise or interpreise or commerce) same (merg\$3 or integrat\$3 ) and ((top near2 down) or (root near2 leaf) or (depth near2 first) )	USPAT	OR	OFF	2007/05/24 11:06
S12	138	(business or enterprise or interpreise or commerce) near5 (merg\$3 or integrat\$3 ) and ((top near2 down) or (root near2 leaf) or (depth near2 first) )	USPAT	OR	OFF	2007/05/24 10:51

## EAST Search History

S13	1325	(business or enterprise or interpeise or commerce) near5 (merg\$3 or integrat\$3 ) and ( interface or api or interaction or interoperability ) and (stor\$3 or database or library or libraries) and (process or task or job or work or workflow or rule) and (level or hierarchy or abstract\$3 ) and (error or fault or inconsisten\$4 or contradict\$3 ) and (model\$3 or tree or graph\$3 or node or transition or arc or dag or digraph or fsm or fsa )	USPAT	OR	ON	2007/05/24 10:56
S14	7019	( (analyz\$3 or analysis or examin\$5 identify\$3 ) near5 rule) (business or enterprise or interpeise or commerce) near5 (merg\$3 or integrat\$3 ) and ( interface or api or interaction or interoperability ) and (stor\$3 or database or library or libraries) and (process or task or job or work or workflow or rule) and (level or hierarchy or abstract\$3 ) and (error or fault or inconsisten\$4 or contradict\$3 ) and (model\$3 or tree or graph\$3 or node or transition or arc or dag or digraph or fsm or fsa )	USPAT	OR	ON	2007/05/24 10:57
S15	38	( (analyz\$3 or analysis or examin\$5 identify\$3 ) near5 rule) same (business or enterprise or interpeise or commerce) near5 (merg\$3 or integrat\$3 ) and ( interface or api or interaction or interoperability ) and (stor\$3 or database or library or libraries) and (process or task or job or work or workflow or rule) and (level or hierarchy or abstract\$3 ) and (error or fault or inconsisten\$4 or contradict\$3 ) and (model\$3 or tree or graph\$3 or node or transition or arc or dag or digraph or fsm or fsa )	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/05/24 11:21
S16	0	S11 and S15	USPAT	OR	OFF	2007/05/24 11:06
S17	52	( (analyz\$3 or analysis or examin\$5 identify\$3 ) near5 rule) near5 (business or enterprise or interpeise or commerce) near5 (merg\$3 or integrat\$3 )	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/05/24 11:22

## EAST Search History

S18	80	( (analyz\$3 or analysis or examin\$5 identify\$3 ) near5( rule or process) ) near5 (business or enterprise or interprise or commerce) near5 (merg\$3 or integrat\$3 )	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/05/24 11:22
S19	24	("5341500"   "5390173"   "5557798"   "5581691"   "5790855"   "5884317"   "5889988"   "5913065"   "5926637"   "5960421"   "6006277"   "6038601"   "6115744"   "6128742"   "6151608"   "6216151"   "6236999"   "6253257"   "6349298"   "6557164"   "6687745"   "6807580"   "6816902"   "6934755").PN. OR ("7120896").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2007/05/24 16:16
S20	1	"5699507".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2007/05/24 16:16
S21	1456	(merg\$3 or integrat\$3 ) same (business or enterprise or interprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (rules or tasks or processes or steps)	USPAT	OR	OFF	2007/05/29 15:42
S22	527	(merg\$3 or integrat\$3 ) same (business or enterprise or interprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (rules or tasks or processes or steps) and (error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (graph\$3 or node or vertice or digraph or tree or dag or edge or "depth first" or travers\$3 )	USPAT	OR	ON	2007/05/29 15:47

## EAST Search History

S23	97	(merg\$3 or integrat\$3 ) near5 (business or enterprise or enterprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (rules or tasks or processes or steps) and (error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (graph\$3 or node or vertice or digraph or tree or dag or edge or "depth first" or travers\$3 ) and (find\$3 or identify\$3 or determin\$3 or identification or id discover\$3 or detect\$3 ) near3 (error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) and (modify\$3 or modification or edit\$3 or chang\$3 or alter\$5 ) near3 (rules or tasks or processes or steps )	USPAT	OR	ON	2007/05/29 15:51
S24	108	(merg\$3 or integrat\$3 ) near5 (business or enterprise or enterprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (rules or tasks or processes or steps) and (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) near5 (graph\$3 or node or vertice or digraph or tree or dag or edge or "depth first" or travers\$3 ) and (find\$3 or identify\$3 or determin\$3 or identification or id discover\$3 or detect\$3 ) near3 (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) and (modify\$3 or modification or edits\$3 or chang\$3 or alter\$5 or correct\$3 ) near3 (rules or tasks or processes or steps )	USPAT	OR	ON	2007/05/29 16:44

## EAST Search History

S25	238	(merg\$3 or integrat\$3 ) near5 (business or enterprise or enterprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (system near3 integration) and (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) same (rule or task or process or step) and (graph\$3 or node or vertice or digraph or tree or dag or edge or "depth first" or travers\$3 ) and (find\$3 or identify\$3 or determin\$3 or indentification or id or discover\$3 or detect\$3 ) near3 (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) and (modify\$3 or modification or edits\$3 or chang\$3 or alter\$5 or correct\$3 ) near3 (rule or task or process or step )	USPAT	OR	ON	2007/05/29 16:49
S26	207	(merg\$3 or integrat\$3 ) near3 (business or enterprise or enterprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (system near3 integration) and (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) same (rule or task or process or step) and (graph\$3 or node or vertice or digraph or tree or dag or edge or "depth first" or travers\$3 ) and (find\$3 or identify\$3 or determin\$3 or indentification or id or discover\$3 or detect\$3 ) near3 (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) and (modify\$3 or modification or edits\$3 or chang\$3 or alter\$5 or correct\$3 ) near3 (rule or task or process or step )	USPAT	OR	ON	2007/05/29 16:49

## EAST Search History

S27	185	(merg\$3 or integrat\$3 ) near3 (business or enterprise or enterprise or office or work\$4 ) and (rules or tasks or processes or steps ) and (system near3 integration) and (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) same (rule or task or process or step) and (graph\$3 or node or vertice or digraph or tree or dag or edge or "depth first" or travers\$3 ) and (find\$3 or identify\$3 or determin\$3 or indentification or id or discover\$3 or detect\$3 ) near3 (defect or error or fault or invalid\$5 or inconsisten\$4 or verify\$3 or verification ) and (modify\$3 or modification or edits\$3 or chang\$3 or alter\$5 or correct\$3 ) near3 (rule or task or process or step ) and ( process and rule and (api or interface) and database )	USPAT	OR	ON	2007/05/29 16:50
S28	166	S27 not S24	USPAT	OR	ON	2007/05/29 16:58
S29	64	S27 not S24 and "business rules"	USPAT	OR	ON	2007/05/29 17:04
S30	385	"business rules" same (graph\$3 or model\$3 or tree or node or dag or transition\$3 or root or travers\$3 )	USPAT	OR	ON	2007/05/29 17:06
S31	107	"business rules" near5 (graph\$3 or model\$3 or tree or node or dag or transition\$3 or root or travers\$3 )	USPAT	OR	ON	2007/05/29 17:14
S32	102	S31 not S24	USPAT	OR	ON	2007/05/29 17:14

 [Subscribe \(Full Service\)](#) [Register \(Limited Service, Free\)](#) [Login](#)

**Search:**  The ACM Digital Library  The Guide

+integrat\* +business +process



 [Feedback](#) [Report a problem](#) [Satisfaction survey](#)

Published since January 1990 and Published before July 2003  
Terms used **integrat business process**

Found 7,228 of 96,755

Sort results by



 [Save results to a Binder](#)

[Try an Advanced Search](#)

Display results



 [Search Tips](#)

[Try this search in The ACM Guide](#)

[Open results in a new window](#)

Results 1 - 20 of 200

Result page: **1** [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [next](#)

Best 200 shown

Relevance scale 

## **1 A methodology for integrating business process and information infrastructure models**

 Michael K. Painter, Ronald Fernandes, Natarajan Padmanaban, Richard J. Mayer  
November 1996 **Proceedings of the 28th conference on Winter simulation WSC '96**

**Publisher:** ACM Press, IEEE Computer Society

Full text available:  [pdf\(861.81 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Many organizations today undertake Business Process Reengineering (BPR) and information infrastructure (i.e., network hardware, communications, and applications infrastructure) modernization efforts to drastically reduce costs and improve performance. While these efforts would appear to be mutually supportive and complementary in nature, they are rarely conducted jointly. Although it is known that changes to one of these two facets of the organization can produce significant impacts on the other ...

## **2 Integrated document and workflow management applied to the offer processing of a machine tool company**

 Stefan Morschheuser, Heinz Raufer  
August 1995 **Proceedings of conference on Organizational computing systems COCS '95**

**Publisher:** ACM Press

Full text available:  [pdf\(1.29 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Introducing document and workflow management systems causes two main problems: How can the supported business processes be adequately modeled? How can existing information systems and databases be integrated? Within this paper, we present tools, methods and other approaches, which are designed to solve these problems. They are illustrated by the offer processing of a machine tool company. This process starts with a custome ...

## **3 Application integration framework for a large business process redesign project**

 Jon Sholberg, Jim Illback  
January 2000 **Addendum to the 2000 proceedings of the conference on Object-oriented programming, systems, languages, and applications (Addendum) OOPSLA '00**

**Publisher:** ACM Press

Full text available:  [pdf\(35.46 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Boeing has nearly completed a major program for business process redesign. Given the scale of this project and the large number of existing, heterogeneous systems, it has been essential that a standards-based architecture be implemented. The Common Object Request Broker Architecture (CORBA) standard has worked well as the application integration baseline for this new system

4 Flexible support for business processes: extending cooperative hypermedia with process support

 Jörg M. Haake, Weigang Wang  
November 1997 **Proceedings of the international ACM SIGGROUP conference on Supporting group work: the integration challenge GROUP '97**  
**Publisher:** ACM Press  
Full text available: [pdf\(1.62 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** activity space, cooperative work, flexible workflow, hypermedia

5 Integrating information requirements along processes: a survey and research directions

 C. Francalanci, A. Fuggetta  
January 1997 **ACM SIGSOFT Software Engineering Notes**, Volume 22 Issue 1  
**Publisher:** ACM Press  
Full text available: [pdf\(960.67 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Information requirements have traditionally been collected separately for different business functions and then integrated into an overall specification. The recent orientation to a process perspective in managing business activities has emphasized early integration, by concurrently analyzing business processes and information requirements. Accordingly, information requirements analysis methodologies should take into account these new integration needs. In the paper, we discuss these new integra ...

6 Data mining by business users: integrating data mining in business processes

 Marcel Holsheimer  
August 1999 **Tutorial notes of the fifth ACM SIGKDD international conference on Knowledge discovery and data mining KDD '99**  
**Publisher:** ACM Press  
Full text available: [pdf\(1.72 MB\)](#) Additional Information: [full citation](#), [index terms](#)

7 Creating a knowledge management architecture for business process change

 Jurgen Vanhoenacker, Antony Bryant, Guido Dedene  
April 1999 **Proceedings of the 1999 ACM SIGCPR conference on Computer personnel research SIGCPR '99**  
**Publisher:** ACM Press  
Full text available: [pdf\(1.34 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 Business process oriented information management: conceptual models at work

 P. Peters, P. Szczurko, M. Jarke, M. Jeusfeld  
August 1995 **Proceedings of conference on Organizational computing systems COCS**

'95

**Publisher:** ACM PressFull text available:  pdf(1.43 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The reorganization of function-oriented, hierachically structured firms into interacting business process networks of functional islands integrated by flow of material and information is a major challenge for a company that wants to meet the steadily changing business demands of today. As information has become an important production resource during the last decades, the reorganization of information management has to accompany organizational restructuring. In this paper we propose ...

**9 Process and workflow management: Introducing eServices in business process****models**

Lerina Aversano, Gerardo Canfora

July 2002 **Proceedings of the 14th international conference on Software engineering and knowledge engineering SEKE '02****Publisher:** ACM PressFull text available:  pdf(249.37 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The need for automatic support of business processes that extend over the boundaries of an enterprise is a recognized need of emerging virtual organizations. To make workflow technologies useful during the enactment of business processes involving many partners that reciprocally provide and consume services, it is important to provide a model, and supporting technologies, to manage the introduction of services in workflow models. This paper introduces a framework for the introduction of eServices ...

**Keywords:** eServices, process models, workflow management**10 The effects of complexity on business processes reengineering: values and limitations of modeling and simulation technologies**

Mohsen M. Fathee, Ray Redd, Darcy Gorgas, Batoul Modarres

December 1998 **Proceedings of the 30th conference on Winter simulation WSC '98****Publisher:** IEEE Computer Society PressFull text available:  pdf(67.65 KB) Additional Information: [full citation](#), [references](#), [index terms](#)**11 Simulation for intra- and inter-organisational business process modelling** George M. Giaglis, Ray J. Paul, Georgios I. DoukidisNovember 1996 **Proceedings of the 28th conference on Winter simulation WSC '96****Publisher:** ACM Press, IEEE Computer SocietyFull text available:  pdf(838.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Business process modelling (BPM) is an increasingly emerging field of simulation application. Although it has been practically demonstrated that simulation can be an effective tool for business redesign, there does not exist a comprehensive framework to explain the characteristics of business processes and identify specific requirements for their modelling. Furthermore, hardly any attention has been paid to the modelling of inter-organisational business systems. In this paper, we examine the nat ...

**12 Enterprise architecture for business process simulation**

Ali Bahrami, Deborah Sadowski, Soheila Bahrami

December 1998 **Proceedings of the 30th conference on Winter simulation WSC '98****Publisher:** IEEE Computer Society Press

Full text available:  pdf(174.64 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**13 The ORION project: staged business process reengineering at FedEx** 

 James W. Candler, Prashant C. Palvia, Jane D. Thompson, Steven M. Zeltmann  
February 1996 **Communications of the ACM**, Volume 39 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(196.84 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**14 Requirements for transitioning business process simulation models to real-time operational systems** 

 Peter Floss  
December 1997 **Proceedings of the 29th conference on Winter simulation WSC '97**

**Publisher:** ACM Press, IEEE Computer Society

Full text available:  pdf(475.84 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

**15 Designing more deeper: integrating task analysis, process simulation, & object definition** 

 Keith A. Butler, Chris Exposito, Dan Klawitter  
August 1997 **Proceedings of the conference on Designing interactive systems: processes, practices, methods, and techniques DIS '97**

**Publisher:** ACM Press

Full text available:  pdf(1.10 MB) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** business oriented components, object modeling, process modeling, task modeling, user-centered design

**16 Business-to-business interactions: issues and enabling technologies** 

B. Medjahed, B. Benatallah, A. Bouguettaya, A. H. H. Ngu, A. K. Elmagharmid  
May 2003 **The VLDB Journal — The International Journal on Very Large Data Bases**,  
Volume 12 Issue 1

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  pdf(558.34 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

Business-to-Business (B2B) technologies pre-date the Web. They have existed for at least as long as the Internet. B2B applications were among the first to take advantage of advances in computer networking. The Electronic Data Interchange (EDI) business standard is an illustration of such an early adoption of the advances in computer networking. The ubiquity and the affordability of the Web has made it possible for the masses of businesses to automate their B2B interactions. However, several issu ...

**Keywords:** B2B Interactions, Components, E-commerce, EDI, Web services, Workflows, XML

**17 Enterprise integration with ERP and EAI** 

 Jinyoul Lee, Keng Siau, Soongoo Hong  
February 2003 **Communications of the ACM**, Volume 46 Issue 2

**Publisher:** ACM Press

Full text available: [pdf\(106.82 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)  
[html\(30.74 KB\)](#)

Comparing internal and external approaches to enterprise business integration.

**18 On the complementarity of workflow management and business process modeling** 

 Stefan Jablonski

August 1995 **ACM SIGOIS Bulletin**, Volume 16 Issue 1

**Publisher:** ACM Press

Full text available: [pdf\(752.44 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

The way business processes are implemented currently is out-of-date. It cannot keep pace with the rapid changes of today's business behavior. Thus, new ways to structure business processes have to be investigated. Business process reengineering is the upcoming discipline that is able to cope with the requirements posted by today's way of conducting business. However, models of business processes defined through business process reengineering still lack a suitable execution environment. Conventio ...

**19 The seven major aspects of enterprise modelling and integration: a position paper** 

 Soon Huat Lim, Neal Juster, Alan de Pennington

April 1997 **ACM SIGGROUP Bulletin**, Volume 18 Issue 1

**Publisher:** ACM Press

Full text available: [pdf\(470.29 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Enterprise Engineering (EE), Enterprise Integration (EI), Enterprise Modelling (EM) and Enterprise Integration Modelling (EIM), which have been given the collective term "Enterprise Modelling and Integration" (EMI) in this paper, are all concerned with, in one way or another, the definition, analysis, redesign and integration of business processes, process data & knowledge, software applications and information systems within an enterprise in order for it to achieve marked advancements i ...

**20 Applications in logistics, transportation, and distribution: Manufacturing supply chain applications: modeling computer assembly operations for supply chain integration** 

Sanjay Jain, Ngai Fong Choong, William Lee

December 2002 **Proceedings of the 34th conference on Winter simulation: exploring new frontiers WSC '02**

**Publisher:** Winter Simulation Conference

Full text available: [pdf\(634.78 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Factory operations have been modeled for years to understand the relationship between the different design and policy factors and the performance measures of interest. The increasing awareness of the need to manage factories as a link in the supply chain places a corresponding requirement for an enhanced approach for factory modeling. This paper describes the modeling of a computer assembly factory for supply chain integration by including aspects of inbound and outbound logistics and relevan ...

Results 1 - 20 of 200

Result page: [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [next](#)

The ACM Portal is published by the Association for Computing Machinery. Copyright © 2007 ACM, Inc.

[Terms of Usage](#) [Privacy Policy](#) [Code of Ethics](#) [Contact Us](#)

Useful downloads: [Adobe Acrobat](#) [QuickTime](#) [Windows Media Player](#) [Real Player](#)